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December 4, 2012

Dania Zinner
USEPA; Region 8
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Dear Ms. Zinner:

EPA CONTRACT NUMBER EP-W-10-033
TASK ORDER NUMBER 2019
QA SUPPORT FOR THE LIBBY ASBESTOS SITE

Enclosed please find the Third Quarter 2012 Quarterly QA Report. This report is a deliverable under Task 6 of the subject Task Order.

If you have any questions, please feel free to contact me.

Sincerely,

Timothy L. Vonnahme
Audit Group Manager, QATS Program

cc: Shari Myer, EPA-ASB QATS Project Officer
Administrative Contracting Officer (Letter only)
Audit Group Files

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TECHNICAL MEMORANDUM

TO: Dania Zinner, USEPA Region 8

FROM: Michael Lenkauskas, Shaw Environmental, Inc.

DATE: December 4, 2012

SUBJECT: Third Quarter 2012 Quarterly QA Report – Task Order 2019

This technical memorandum represents the Third Quarter 2012 Quarterly QA Report for Task Order 2019, *Quality Assurance Support for the Libby Asbestos Site*. Since this is the first quarterly report, it includes, by task and QA element, a summary of QA procedures for the period of January 17, 2012 to September 30, 2012. The QA elements addressed in this quarterly report are consistent with Tasks 1-9 of Task Order 2019, and represent work performed by Shaw Environmental, Inc. under its Quality Assurance Technical Support contract EP-W-10-033.

Task 1 – Review of Existing Quality Documents

Laboratory modifications available in the e-Room were reviewed to determine which laboratory modifications are currently active and/or require revisions to identify those that should be retired; and to ensure consistency and compatibility between other laboratory modifications, SOPs, and other quality documents. The need for laboratory modifications was identified during a conference call on 02/16/ 2012, during which each of the laboratory modifications was discussed, its status determined, and the need for revisions discussed. From this call, it was determined that 19 laboratory modifications could be retired and that 14 were to remain active. Of these 14, eight needed revisions to reflect current analytical procedures. The status of the revisions was discussed during subsequent monthly conference calls. The table below provides the status of the laboratory modifications as of the last monthly conference call on 09/19/2012. Following the table is a more detailed description of each laboratory modification.

Lab Mod	Description	Status	Date
LB-000015A	PCM lab mod	Signed and Active	09/24/2012
LB-000016H	TEM-ISO lab mod	Signed and Active	03/19/2012
LB-000020B	TEM Water lab mods	Signed and Active	09/25/2012
LB-000029C	TEM QC	Signed and Active	05/04/2012
LB-000031G	AHERA and ASTM lab mod	Signed and Active	04/30/2012
LB-000040A	Use ASTM D5755-09, not D5755-03 for dusts	Signed and Active	01/25/2012
LB-000055A	Drying ambient airs	ESAT to update (LB-000055B)	NA
LB-000066C	Structure photos, spectra, and NaK codes	ESAT to update (LB-000066E)	NA

Lab Mod	Description	Status	Date
LB-000066D	Structure photos, spectra, and NaK codes	ESAT to update (LB-000066E)	NA
LB-000067B	Valid values for Structure ID	Signed and Active	09/19/2012
LB-000073C	PLM lab mod	In Review	NA
LB-000085A	TEM calibrations	Signed and Active	05/04/2012
LB-000087	PLM-9002 data reporting	Signed and Active	05/04/2012
LB-000088	Effective date of SOPs SRC-Libby-01 (Rev.3), SRC-Libby-03 (Rev.3), and Libby-ISSI-01 (Rev. 11)	QATS will finalize after all three SOPs have been revised.	NA
LB-000089	Temporary mod for 2010 and 2011 Libby ABS Data Verification Findings as they relate to stopping rules	ESAT to write	NA

- LB-000015A – This modification documents permanent modifications and clarifications to the Phase Contrast Microscopy (PCM) analysis of air samples using the NIOSH 7400 Method.
- LB-000016H – This modification documents permanent modifications and clarifications to TEM structure recording rules for ISO 10312 and documents previous historical modifications and clarifications. This modification applies to all Libby TEM samples where the ISO 10312 counting rules apply, regardless of sample matrix (air, dust, water, woodchip/duff, tree bark, and tissue samples).
- LB-000020B – This modification applies to the preparation and analysis of water samples for the Libby Project. As of 07/27/2010, it requires all water samples associated with the Libby Superfund Site (including OU3) to undergo treatment with ozone/UV light and sonication prior to filtration as specified in Section 6.2 of EPA Method 100.1 (EPA 1983a). Only polycarbonate (PC) or mixed cellulose ester (MCE) filters with a pore size of 0.2 µm or smaller should be used for filtering water samples. On the bench sheets, the preparation date should be recorded as the filtration date, not the grid preparation date. Recording rules will be as described in the ISO 10312 (ISO 1995) method, except that the aspect ratio and minimum length requirements will be specified in the applicable governing Analytical Requirements Summary Sheet.
- LB-000029C – This modification documents permanent clarifications to laboratory-based quality control (QC) analysis requirements for TEM. The purpose of this modification is to standardize the frequency of analysis and procedures for the selection and interpretation of the results for laboratory-based TEM QC analyses (regardless of sample medium).
- LB-000031G – This revision combines the modifications described in LB-000017, LB-000017A, LB-000031, and LB-000031A into one summary of the permanent modifications to the TEM structure recording rules for air samples by AHERA and dust samples by ASTM D5755. The purpose of the modification is to document historic modifications and clarifications and provide additional, permanent clarifications.
- LB-000040A – This modification documents the requirements for project documents and analytical results to utilize ASTM D5755-09 in replacement of ASTM D5755-03.
- LB-000055A – This laboratory modification addresses sample collection procedures for the Outdoor Ambient Air Monitoring Programs for the Libby Asbestos Superfund Site, including the ambient air programs for Operable Unit 4 (OU4) and OU7 (Troy). Due to meteorological conditions prevalent in Libby in the late fall (e.g., fog, inversions,

other potential precipitation), the collected air filters have the potential to arrive at the laboratory in a damp condition. To allow these samples to be properly prepared for TEM analysis and to prevent subsequent biological growth, this modification requires all ambient air samples to be dried upon receipt at the on-site laboratory (e.g., EMSL-Libby), prior to further preparation/analysis at the on-site laboratory, or prior to transfer to another laboratory for further preparation/analysis.

- LB-000066C – This temporary modification applies to all investigative samples (as defined in the most recent version of LB-000053) evaluated at the Libby Superfund Site. This temporary modification requires all analytical laboratories to: 1) complete the structure comment field to characterize particles with regard to the levels (presence/absence) of the sodium and potassium peaks observed in the energy dispersive spectrometry (EDS) spectrum; 2) record on the data sheets all non-asbestos material (NAM) particles that are "close calls"; 3) increase the frequency that EDS spectra are saved for "LA" and "close call" structures; 4) increase the frequency that photographic images of particle morphology are recorded for "LA" and "close call" structures; and 5) complete the comment field to record mineral type of each recorded particle, including "LA", "OA", "C" and "close call" NAM particles.
- LB-000066D – This permanent modification applies to all Libby site investigative samples as defined by in the relevant SAPs and analyzed by TEM. This modification does not apply to non-investigative samples. Based on this modification, all analytical laboratories shall: 1) indicate on the count sheet the presence or absence of sodium and potassium in all recorded structures (except chrysotile); 2) record on the count sheet "close-call" NAM particles; 3) record the probable mineral species of each recorded structure; 4) record EDS spectra of "LA" and "close-call" NAM particles; and 5) record 1 photomicrograph of a SAED (selected area electron diffraction) pattern for each "LA" or "OA" amphibole type encountered in a sample.
- LB-000067B – The purpose of this modification is to consolidate three modifications that are applicable to all TEM methods into a single modification.
- LB-000073C – The purpose of this modification is to provide permanent clarifications to inter-laboratory analyses for the Libby-specific PLM-VE (SRC-LIBBY-03) and PLM-Grav (SRC-LIBBY-01) methods. This modification standardizes the selection and analysis procedures for inter-laboratory samples of soil.
- LB-000085A – The purpose of this modification is to standardize the frequencies and performance criteria of instrument calibrations at all TEM laboratories that analyze samples for the Libby Project. Contamination monitoring by air sampling at the labs is also described in this modification.
- LB-000087 – This modification documents clarification of the PLM NIOSH Method 9002 asbestos mineral identification criteria as applied to the identification of tremolite-actinolite, and its presence as "LA" in soils collected from the Libby Superfund Site. It also describes the historical recording and reporting of tremolite-actinolite and "LA", respectively, in samples analyzed by NIOSH Method 9002 prior to 03/14/2012; how the Scribe database will be updated to address the described inconsistencies; and how samples identified as containing tremolite-actinolite by this method will be qualified to document their inclusion in "LA" solid solution series in all future deliverables.
- LB-000088 – This modification will document the effective dates of SOPs SRC-Libby-01 (Revision 3), SRC-Libby-03 (Revision 3), and Libby-ISSI-01 (Revision 11). The modification is pending finalization of the revisions.
- LB-000089 – This is a temporary modification for the 2010 and 2011 Libby ABS Data Verification Findings as they relate to the stopping rules. This modification is in the process of being written.

During the quarter QATS also performed reviews and provided comments to ten (10) field and laboratory SOPs listed below, and one data management plan, EPA Libby Data Management Plan.

SOP	SOP Title	Revision
EPA-Libby-2012-01	Field Logbook Content and Control	0
EPA-Libby-2012-02	Photographic Documentation of Field Activities	0
EPA-Libby-2012-03	Control of M&TE	0
EPA-Libby-2012-05	Handling IDW	0
EPA-Libby-2012-06	Sample Custody	0
EPA-Libby-2012-07	Packaging and Shipping Environmental Samples	0
EPA-Libby-2012-11	Sampling and Analysis of Duff for Asbestos	3
EPA-Libby-2012-12	Sampling and Analysis of Tree Bark for Asbestos	4
PLM-VE SOP SRC-Libby-03	Analysis of Asbestos Fibers in Fine Soil by Polarized Light Microscopy	3
SOP SRC-Libby-01	Qualitative Estimation of Asbestos in Coarse Soil by Visual Examination Using Stereomicroscopy and Polarized Light Microscopy	3

Task 2 – Libby Amphibole Laboratory-specific Mentoring Program Support.

Written direction was received (via e-mail) from the Task Order Manager (TOM) to participate in Libby Laboratory Conference Calls as part of the laboratory mentoring program. This activity was previously performed under Task 7. QATS participated in eight (8) Libby Laboratory Conference Calls during this performance period, during which the following issues were discussed:

03/14/2012 Conference Call
- The indirect-transfer survey
- Rock Flour Prep for Fluidized Bed Samples
- Status of revisions to select laboratory modifications

04/11/2012 Conference Call
- Surface Water and Fill Material SAP Analytical Summary
- Sample Archive
- Lab Modification Form LB-000016H
- Minimum Filter Pore Size for Indirect Preps
- Site-Wide Quality Assurance Reference Document
- Recording of LA on PLM-VE Bench Sheets
- Libby Lab Mod LB-000024

05/03/2012 Conference Call
- Development of a new reporting electronic deliverable by CDM-Smith, which will be capable of exporting Scribe-ready files.

05/13/2012 Conference Call
- Laboratory Modifications to be finalized
- Laboratory Modification LB-000085A
- Laboratory Modification LB-000016H
- Site-wide Quality Assurance Reference Document (QARD)
- The status of the new Libby-specific electronic data deliverables (EDDs)

06/13/2012 Conference Call

- OU3 Conflict of Interest Update
- Libby Scribe-Ready EDDs
- Libby Lab Mod Update
- Quarterly Instrument Calibration/Air Monitoring
- Status of Revisions to PLM-VE and PLM-Grav SOPs
- Laboratory-Specific Slide Mounts from the 0.2% and 1.0% LA standards
- Definition of “LA”, “WRTA”, etc.

07/11/2012 Conference Call

- OU3 Conflict of Interest Update
- Follow-up from previous Libby Lab call (i.e. mod revisions)
- NVLAP waiver
- Magnesio-riebeckite classification
- PLM and TEM instrument calibration requirements
- On-site audit update (i.e. common observations)

08/23/2012 Conference Call

- OU3 conflict of interest update
- TEM inter-laboratory analyses and sample storage
- New EDD for composite tree bark sampling
- Troy SAP analytical summaries
- Status of SOPs SRC-Libby-01 (rev. 3), SRC-Libby-03 (rev. 3), and Libby- ISSI-01 (rev. 11)
- Status of Libby laboratory modification
- Duplicate analysis ID’s
- Scanned data deliverables

09/19/2012 Conference Call

- Eventual transfer of sample and hard copy data currently stored at laboratories.
- Transfer/submittal of hard copy (scanned) and electronic deliverables to ESAT from laboratories.
- Laboratory blank naming convention
- Multiple filter replicates for tree bark and duff samples
- Status of PLM-VE and PLM-Grav SOPs
- Libby laboratory modification status update
- Quarterly Calibration reminder for 3rd quarter 2012

Task 3 – Track and Coordinate Quality Control (QC) Sample Programs

Quality Control (QC) Sample Program

In accordance with laboratory modification LB-000073C, a representative sampling (1%) of soil samples analyzed by Polarized Light Microscopy (PLM) Visual Estimation (VE) in 2009, 2010, and 2011 were selected for an inter-laboratory study. A total of 116 soil samples analyzed by PLM-VE were selected for the inter-laboratory study, including 16 for 2009, 45 samples for 2010, and 55 samples for 2011.

On 09/04/2012, QATS delivered a report summarizing the results of this PLM inter-laboratory study and on 11/20/2012, provided a revised report that included performance evaluation sample (PES) results. Only 3 of 116 analyses (2.6%) were strongly discordant, which rates overall laboratory performance as "Good" (i.e., <5% strongly discordant).

2007/2008 PLM-VE Data Rejection Investigation

PLM data from two years were sorted and various trends in the data were evaluated. As a result, PLM data from 2007 and 2009 were rejected due to discordant inter-laboratory sample results. Of the inter-laboratory sample results queried, 12% of the results were concordant (same bin category); 36% of the results were weakly discordant (±1 bin category); and 52% of the results were strongly discordant (±2 bin category). For comparison, the 2009-2011/2012 inter-laboratory results were 61% concordant (dominantly non-detects), 36% weakly discordant, and 3% strongly discordant. The cause for the 2007/2008 data rejection was a high bias for the earlier analyses. That pattern was repeated for the 2009-2011/2012 data where 35% of the initial analyses had higher concentrations, but only 4% had lower concentrations.

Task 4 – Asbestos Sample Data Validation

QATS has begun the development of validation Standard Operating Procedures (SOPs) and associated validation checklists for TEM, PLM, and PCM analyses. Spreadsheets have been developed to record laboratory quarterly calibration submissions in an effort to streamline the validation process. Microscope TEM and PLM calibration data for Quarters 1, 2, and 3 of 2012 have been entered into the spreadsheets. The calibration data are entered into spreadsheets, which allows laboratories to only submit the calibration data once, and not with every submitted data package. This also streamlines the validation process by allowing the validator to evaluate the calibration data once, and not every time the calibration data are submitted with each data package.

Task 5 – Asbestos Laboratory On-site Audit Support

QATS supported seven (7) on-site laboratory audits and one (1) sample preparation facility (SPF) audit under Task 5. Each on-site audits involved preparation (including checklist preparation), technical support, and report generation. Listed below are the laboratories audited and the date(s) of the audits.

- EMSL, Denver, CO (05/21-22/2012)
- ESAT Region 8, Golden, CO (05/22-23/2012)
- EMSL, Cinnaminson, NJ (06/26-27/2012)
- EMSL, Beltsville, MD (06/28-29/2012)
- Hygeia Laboratories, Sierra Madre, CA (07/25-26/2012)
- Sample Preparation Facility (SPF), Troy, MT (08/07/2012)
- EMSL, Libby, MT (08/08-09/2012)
- Reservoirs Environmental, Denver, CO (09/12-13/2012)

Common deficiencies that were observed between the laboratories include:

- The laboratory duplicate cross-check (LDC) for PLM-VE observations were recorded on the same bench sheet as the original results. Therefore, the results are not blind.

This deficiency was observed in 75% of the laboratories audited.

- Laboratories were not performing the PLM analysis of fine ground soil as described in the Libby-specific SOP. This deficiency was observed in 62% of the laboratories audited.
- The laboratories were not tracking corrective or preventive actions, follow-ups, and/or dates implemented. This deficiency was observed in 50% of the laboratories audited.
- Analytical balances were either not certified or not calibrated and/or balance calibration is not recorded. Analytical balance deficiencies were observed in 50% of the laboratories audited.
- Libby Amphibole (LA) reference slides were not available. This deficiency was observed in 37% of the laboratories audited.
- The Effective Filtration Area (EFA) of the disposable filter assembly used during indirect preparations had not been determined. This deficiency was observed in 37% of the laboratories audited.
- The plasma ashing time was not consistent, not as determined by the quarterly calibration, and/or not posted. Plasma ashing time deficiencies were observed in 37% of the laboratories audited.
- Corrective actions were not performed for a positive air monitoring result. This deficiency was observed in 25% of the laboratories audited.
- Document control issues were observed in 25% of the laboratories audited.

All of the laboratories provided laboratory responses to the on-site audit reports. The laboratory responses have been reviewed, and EPA resolution reports are currently being developed for EPA review.

Task 6 – Provide Quarterly Report as a Memorandum

This report is the quarterly report.

Task 7 – Participate in Quarterly Laboratory Conference Calls

At the direction of EPA, Libby Laboratory Conference Calls are discussed in Task 2.

Task 8 – Provide Annual Summary Report of all QA Activities performed during the year

No activities were assigned to-date.

Task 9 – Modify Existing Libby Site-wide QAPP

No activities were assigned to-date.